if any human being will be weak enough to enter the hall of dulness. As the clock hands closely approach the hour a thrill of excitement passes through the lecturer and the beadle. Two misguided persons have strayed into the building, and on the arrival of a third depends the reading of the Latin lecture, which is not delivered to a smaller audience than three. Should the third unwelcome guest put in an appearance the deed must be done—the lecturer must make a show of earning the 4*l.* 3*s.* 4*d.* he gets for reading the Latin discourse. Looking rather flustered—perhaps by the consciousness that three wicked wags have conspired to make him work—he opens a well-dog's-cared manuscript, and, reading at a tremendous pace, dashes through a composition which, as a rule, sets criticism at defiance. The good old traditional policy of driving auditors away is well kept up. Long Greek quotations loosely patched together by a rigmarole of doubtful Latinity, and rattled over with an evident intention of getting to the final *dixi* as quickly as possible, are not calculated to enchain the attention of a modern audience. It is only fair to admit that the lecturer sometimes shows a keen appreciation of the dreary farce in which he is the chief actor, and on these occasions condescends to address a few words—in English—to such of the audience as may be 'in at the death.' Feeling that a lecture in Latin needs not, therefore, be either tedious, stupid, or confused, he acknowledges the miserable quality of the rubbish he has just rattled through, and excuses it on the ground that the attendance is not sufficiently great to encourage the production of a good lecture; adding, moreover, that if more people came more pains would be taken. This solemn mockery is repeated every term, so that if all the Latin lectures were read, the majority of the professors would each deliver twelve English and twelve Latin discourses for his 100*l.* per annum—by no means an excessive rate of payment if the lectures really instructed anybody in anything. Unfortunately, as at present conducted, Gresham College is utterly and completely useless to any human being save only the professors and the beadles, who draw their salaries with commendable punctuality. Another matter for regret is, that not only is the use of a commodious building lost, but that a collection of books, which if placed in the City Library would be accessible to students, lies buried in the unprofitable seclusion of the College. If the Gresham Committee take no interest in the important trust confided to them, it is indeed high time that public attention was directed to an antiquated and transparent sham, a disgrace alike to the age and to the city in which it is perpetrated."

We hope that this unsparing exposure will lead to an inquiry into the abuse, and an appropriation of the valuable funds to a purpose much more consistent with the spirit of the will of the benevolent and well-meaning founder.

HÆCKEL'S DEVELOPMENT OF MAN

Anthropogenie oder Entwickelungsgeschichte des Menschen; gemeinverständliche wissenschaftliche Vorträge, von Ernst Hæckel. (Leipzig: Engelmann, 1874.)

THE new volume of so-called popular lectures by Prof. Hæckel bears somewhat the same relation to "The Descent of Man" which his "Schöpfungsgeschichte" did to "The Origin of Species." Few who are acquainted with Mr. Darwin's writings will agree with the criticism lately put forth from the chair of the British Association that they need an expounder. Those, however, who are dissatisfied with his patient analysis of facts and sober deduction of principles will find abundant exposition and extension in such works of his disciples as "The Beginnings of Life," "The History of Creation," and the present volume.

In criticising the vast system of dogmatic cosmogony which is here built up in lectures before a popular audience, one would not for a moment confound it with the flippant confidence of sciolists who attack or defend the theory of evolution, not on its scientific merits, but because it seems to them to support some theological or antitheological prejudice. But it is a matter of deep concern that so justly eminent a biologist as Prof. Hæckel should allow himself, in treating a subject which above all demands the dry light of impartial judgment, to adopt the style of those "who are not of his school—or any school."

The fact is, that the extremely difficult subject of the philogeny of man, demanding an accurate knowledge of embryology and comparative anatomy, both recent and fossil, is not at all fitted for popular treatment. Popularising science ought to mean persuading people to work at some of its branches until they learn to love it, not altering its character so as to make it please the itching ears of idlers.

The really valuable parts of the "Schöpfungsgeschichte" and the "Anthropogenie" must be at once useless and distasteful to such readers; and if they accept all the "advanced" theories laid cut and dried before them, they will be learning a bad lesson in biology. If they happen to have one set of prejudices, they will denounce all science as an invention of the devil; or if they have another, they will degrade it into a mere instrument to insult the feelings of their neighbours. Prof. Hæckel assures his hearers that the history of development contains more valuable knowledge than most sciences and all revelations; but, whether more or less important, the secrets of nature, like those of revelation, can only be gradually learned with patient ear and reverent spirit: they are meaningless or mischievous when accepted without pains or preparation.

Unfortunately, in these lectures the teacher frankly drops the character of the student of nature and assumes that of the combatant. Even in the preface he attacks the "black International" of Rome, "jener unheilbrütender Schaar," with which "at last—at last the spiritual war has begun." We see "the banners unfurled," we hear "the trumpets blown, which muster the hosts for this gigantic struggle." We are shown "whole ranks of dualistic fallacies falling before the chain-shot of monistic artillery, and libraries of Kirchenweisheit and Afterphilosophie (*sic*) melting into nothing before the sun of the History of Development." But when these metaphors are dropt, we find that the objects of this gigantic strife are to prevent certain (unspecified) teaching in primary schools, to suppress convents and celibacy by law, to expunge Sundays and saints' days from the calendar, and to forbid religious processions in the streets!

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After this extraordinary preface, Prof. Hæckel enters on the more serious part of the book by a history of the doctrine of development. Passing rapidly from Aristotle and the founders of biology in the sixteenth and seventeenth centuries, he describes at some length the discoveries of Wolff (published in 1759), which were so long and so unjustly neglected; the scarcely less splendid researches of the now venerable Von Baer (1827), and those of Mr. Darwin, from the appearance of the "Origin of Species" in 1859 to the present time. Among the ontogenists, beside Wolff and Von Baer, whom he justly places in the first rank, due mention is made of Pander, Rathké, Bischoff, Johannes Müller, Kölliker, Remak, Fritz Müller, and Kowalevsky. But while most English embryologists (and histologists too) will probably agree in substance with our author's judgment on the doctrines of Reichert and of His, they would scarcely speak of a distinguished living anatomist as "dieser auserordentlich unklare und wüste Kopf." Among the philogenists who preceded Darwin, particular attention is paid to the speculations of Lamarck, in his "Philosophie Zoologique," which were published in 1809, and thus exactly divided the century which elapsed between the first great work on the subject, Wolff's "Theoria generationis," and the last, Darwin's "Origin of Species;" and also to those of Goethe, extracts from whose writings, both prose and verse, are scattered up and down the volume, not only in the text, but on the fly-leaves and other blank spaces. We venture to think that both here and elsewhere Prof. Hæckel has put too high a value on these pre-Darwinian speculations. He discovers who proves: and neither Lamarck nor Goethe could justify their guesses by facts. They happened to be right, just as among all the random guesses of the ancient Greek cosmologists Thales happened to have hit on the true relation of the sun to the earth, probably from his being less and not more philosophical than his fellows. If some of the assertions of modern spiritualists or phrenologists should hereafter turn out to be true, they would no less deserve the condemnation of a future generation for believing what, on the facts within their knowledge, they had no business to believe.

The chapters which succeed are devoted to a clear and tolerably full account of the development of the human embryo from the ovum-cell to the stratification of the blastoderm. The only fault to find with this part of the book (and its merits need no praise for those who are acquainted with our author's skill in exposition of a difficult subject) is the exaggeration of such phrases as this: "The process of fecundation is very simple, and involves nothing at all peculiarly mysterious." In one sense, of course, this is true; the ultimate mystery of every function, organic or inorganic, is equal: but fecundation, like other organic functions, has the peculiar mystery that we cannot yet rank it with other mysteries. Most of us believe that one day each movement of each particle of the ovum will receive its appropriate physical explanation, but till then we must be content to call them vital, just as we call other movements chemical: and even a popular lecture should not anticipate the advance of science.

The most important position maintained in this part of the book is that in Vertebrata the two primitive blastodermic layers (epiblast and hypoblast of Huxley, exoderm and entoderm) differentiate each into two, as in Vermes, and that the mesoblast (motorgerminal layer of Remak) subsequently arises by coalescence of Von Baer's Fleischschicht or Hautfaserblatt and Gefässschicht or Darmfaserblatt. The various opinions which have been put forth on this difficult subject are discussed, and the author's view illustrated by some coloured figures. In the number of the *Quarterly Microscopical Journal* for last April there is an article by Prof. Hæckel (very ill-translated) on the "Gastræa" theory which was put forth in his valuable work on "Calcareous Sponges;" and there he discusses the homologies of the secondary germ-layers. To it we may refer the English reader as an exposition of this part of the subject, and unfortunately as another instance in justification of what has been said of the dogmatic confidence and undignified personalities which disfigure the present volume.

The description of the further development of the human embryo, including a short account of the origin of the various organs, is an excellent example of how a very complicated subject may be explained and illustrated. The figures from Bischoff, Kölliker, Gegenbaur, and other anatomists are somewhat coarsely reproduced, but are supplemented by some new drawings on stone. These chapters, however, on human ontogeny and organogeny are unexceptionable and somewhat commonplace. They seem to be chiefly introduced for the sake of the philogeny which occupies the third series of lectures. It is the close connection between the known development of the individual and the hypothetical development of the race which it is the merit or demerit of the book to expound to a popular audience, and to this subject we hope to refer in a future article.

LETTERS TO THE EDITOR

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts. No notice is taken of anonymous communications.*]

Migration of Birds

I HAVE to thank Mr. Wallace and Mr. Romanes for their remarks (NATURE, vol. x. pp. 459 and 520) on the article in which I drew attention to this subject. The former especially has laid all ornithologists under an obligation for the characteristic skill with which he has illustrated the way whereby migratory habits have most likely been brought about. I think it is very possible, as he suggests, "that every gradation still exists in various parts of the world, from a complete coincidence to a complete separation of the breeding and subsistence areas," and that "we may find every link between species which never leave a restricted area in which they breed and live the whole year round, to those other cases in which the areas are absolutely separated." Still, I cannot point out any species which I believe to be, as a species, strictly non-migratory. No doubt many persons would at first be inclined to name half a dozen or more which are unquestionably resident with us during the whole year, and even inhabit the same very limited spot. But I think that more careful observation of the birds which are about us, to say nothing of an examination of the writings of foreign observers, will show that none of them are entirely free from the migratory impulse. Perhaps the nearest approach, among British birds, to an absolutely non-migrant may be found in our familiar Hedge Sparrow. Personally, I have never been able to detect any movement in this bird, but one has only to turn to works on the ornithology of the extreme north and south of Europe to see that it is affected like the rest, and even in the Orkneys it is described as an occasional autumnal visitant. However, in most of the

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